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SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
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**Declaration under Rule 4.17:**

— of inventorship (Rule 4.17(iv)) for US only

**Published:**

— with international search report  
— before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: USE OF ALPHA-KETOGLUTARIC ACID FOR THE TREATMENT OF MALNUTRITION OR HIGH PLASMA  
GLUCOSE CONDITION

(57) Abstract: A method for improving adsorption of amino acids in a vertebrate, including mammal and bird, is included. The method comprises administering to a vertebrate, including mammal and bird, in a sufficient amount and/or at a sufficient rate to enable desired effect. AKG, AKG derivatives or metabolites, AKG analogues or mixture thereof. Also contemplated is a method for decreasing adsorption of glucose in a vertebrate, including mammal and bird, in the need thereof, AKG, AKG derivatives or metabolites, AKG analogues or mixture thereof, for decreasing glucose adsorption as well as compositions for use in treatment.



WO 2005/002567 A1

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2004/001062

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61K 31/198 // A23L 1/305

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI DATA, EPO-INTERNAL, CHEM.ABS.DATA, BIOSIS, MEDLINE, EMBASE, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	E. Riedel et al, "alpha-Ketoglutarate Application in Hemodialysis Patients Improves Amino Acid Metabolism", Nephron 1996, 74: 261-265, abstract, page 261; page 264, column 1, paragraphs 1-2  --	1-6,15-20
A	EP 0922459 A1 (AFTING, ERNST-GÜNTHER), 16 June 1999 (16.06.1999), claims 1,3,15,18; [0017], [0013], [0034], [0035], [0029]- [0031], column 7, lines 36-55  --	1-20

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International application No.

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>Shambhu D. Varma, P.S. Devamanoharan, A.H. Ali, "Formation of advanced glycation end (AGE) products in diabetes: Prevention by pyruvate and alpha-keto glutarate", Molecular and Cellular Biochemistry 1997, 171:23-28, abstract</p> <p style="text-align: center;">-- -----</p>	7-14,16-20

**INTERNATIONAL SEARCH REPORT**International application No.  
**PCT/SE 2004/001062****Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: **1-12**  
because they relate to subject matter not required to be searched by this Authority, namely:  
**see extra sheet**
2. ☒ Claims Nos.: **1, 7, 8, 13, 15 (partly)**  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
**see extra sheet**
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## Box II.1

Claims 1-12 relate to methods of treatment of the human or animal body by surgery or by therapy or diagnostic methods practised on the human or animal body (PCT Rule 39.1(iv)). Nevertheless, a search has been executed for these claims. The search has been based on the alleged effects of the compounds or compositions.

## Box II.2

The scope of claims 1, 7, 8, 13 and 15 in as far as the expression "AKG derivates or metabolites, AKG analogues, or mixtures thereof" is concerned, is so unclear (Article 6 PCT) that a meaningful search is impossible with regard to this expression. Consequently, the search has been carried out for the use of AKG (alpha-ketoglutaric acid) and the AKG derivatives specifically mentioned in the description (also specified in claims 2 and 9).

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

01/10/2004

International application No.

PCT/SE 2004/001062

EP 0922459 A1 16/06/1999 DE 19755367 A,C 24/06/1999

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